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AMENDMENTS TO THE CLAIMS

The following is a complete listing of the claims indicating the current status of each claim and including amendments currently entered as highlighted.

1-26. (canceled)

- 27. (original) A method for achieving optical amplification of an optical signal passing through indirect-gap semiconductor, the method comprising the steps of:
 - (a) providing a body of the indirect-gap semiconductor doped with at least one element so as to generate at least one added energy level at a known energy lying within the energy band-gap of the semiconductor, said added energy level enabling an energy transition between said added energy level and an energy band of the semiconductor corresponding to generation of a photon of a given wavelength;
 - (b) irradiating a target region of said body of semiconductor with optical illumination of a wavelength shorter than said given wavelength; and
 - (c) directing an optical signal of said given wavelength through said target region.
- 28. (original) The method of claim 27, wherein said illumination has a wavelength no greater than a wavelength of a photon corresponding to the transition between the conduction gap and the valence band in said semiconductor.

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- 29. (original) The method of claim 27, wherein said at least one element is chosen from the group comprising: Gold, Silver, Platinum, Iron, Copper, Zinc, Cobalt, Tellurium, Mercury, Nickel, Sulfur and Manganese.
- 30. (original) The method of claim 27, wherein said at least one element is chosen from the group comprising: Gold, Silver and Platinum.
- 31. (original) The method of claim 27, wherein said at least one element includes Gold.
- 32. (original) The method of claim 31, wherein said given wavelength is in the range of 1.2-2.2 micrometers.
- 33. (original) The method of claim 27, wherein said irradiating is performed using a pulsed laser source.
- 34. (original) The method of claim 27, wherein said irradiating is performed using a substantially continuously irradiating laser source.
- 35. (original) The method of claim 27, wherein said target region lies at least partially in an optical waveguide formed in said body of semiconductor.
- 36. (original) The method of claim 27, wherein said indirect-gap semiconductor is silicon.

37-41. (canceled)

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42. (new) An apparatus for achieving optical amplification of an optical signal passing through indirect-gap semiconductor, the apparatus comprising:

- (a) a body of the indirect-gap semiconductor doped with at least one element so as to generate at least one added energy level at a known energy lying within the energy band-gap of the semiconductor, said added energy level enabling an energy transition between said added energy level and an energy band of the semiconductor corresponding to generation of a photon of a given wavelength;
- (b) an irradiating arrangement deployed for irradiating a target region of said body of semiconductor with optical illumination of a wavelength shorter than said given wavelength; and
- (c) an optical arrangement for directing an optical signal of said given wavelength through said target region.
- 43. (new) The apparatus of claim 42, wherein said illumination has a wavelength no greater than a wavelength of a photon corresponding to the transition between the conduction gap and the valence band in said semiconductor.
- 44. (new) The apparatus of claim 42, wherein said at least one element is chosen from the group comprising: Gold, Silver, Platinum, Iron, Copper, Zinc, Cobalt, Tellurium, Mercury, Nickel, Sulfur and Manganese.
- 45. (new) The apparatus of claim 42, wherein said at least one element is chosen from the group comprising: Gold, Silver and Platinum.

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(new) The apparatus of claim 42, wherein said at least one element 46. includes Gold.

- (new) The apparatus of claim 46, wherein said given wavelength is in 47. the range of 1.2-2.2 micrometers.
- (new) The apparatus of claim 42, wherein said irradiating is 48. performed using a pulsed laser source.
- 49. (new) The apparatus of claim 42, wherein said irradiating is performed using a substantially continuously irradiating laser source.
- (new) The apparatus of claim 42, wherein said target region lies at 50. least partially in an optical waveguide formed in said body of semiconductor.
- 51. (new) The apparatus of claim 42, wherein said indirect-gap semiconductor is silicon.